

REMARKS

Claims 1-42 are pending in the application. Claims 1-42 stand rejected. No claims are being amended. No new matter is being introduced by way of this Reply.

Applicant described in their previous Reply filed July 26, 2004 that the primary cited reference Cheng *et al.* (U.S. 5,438,595) discloses a system that estimates a speed of a mobile unit relative to a stationary base unit by measuring a difference between short term energies of a plurality of contiguous symbols. Applicant argued that Cheng's use of the detected energies is quite different from Applicant's use of modulation attributes (*i.e.*, amplitude, frequency, or phase modulation attributes) to calculate a metric indicative of a changing environment.

In Examiner's response to arguments on page 2 of the final Office Action at hand, Examiner states that "energy is represented by amplitude squared; therefore energy is the modulation attribute if the amplitude is the modulation attribute." Applicant, however, respectfully urges that Cheng does not actually disclose calculating energy in relation to a modulation attribute for reasons presented below.

Applicant's claim 1 recites, in part, "calculating a metric indicative of a changing environment between the first and the second stations as a function of a change in at least one modulation attribute of a signal transmitted across the wireless link between the first and second stations." The measurement of the modulation attribute(s) is used instead of a simpler signal-to-noise ratio (SNR) measure in determining rapid changes. SNR metrics may produce erroneous results because they are based on an output signal from Automatic Gain Control (AGC) circuitry in the receiver. This is so because the AGC circuitry attempts to maintain at its output a constant signal strength, which necessarily removes amplitude modulation from the signal at the output of the AGC circuitry.

Cheng discloses a system similar to one that determines rapid changes based on SNR. In particular, Cheng discloses in Fig. 4 an AGC circuit using "RF + IF Stages" 72 and "Amp. + I/Q Demodulator" 76. Output from this AGC circuit are received in-phase (RxI) and quadrature (RxQ) signals (collectively RxI/Q). See Cheng, column 5, lines 27-46 for a detailed description of the AGC circuit. A pre-processing circuit 121 in Cheng's Fig. 10 calculates the energy of the RxI/Q signals and uses the energy calculation results to calculate speed estimates. However,

because the RxI/Q signals are outputs after the AGC circuit of Fig. 4, the pre-processing circuit is calculating energy and speed based on the demodulated RxI and RxQ signals. In other words, any amplitude modulation on an RF signal received by mobile unit is removed by the AGC circuits 72 and “Amp. + I/Q Demodulator” 76 of Cheng’s Fig. 4 prior to being received by the pre-processing circuit 121 of Fig. 10. Thus, the energy and speed estimate calculations of Cheng’s Fig. 10 must be calculating energy of codes on the demodulated signals. The RxI/Q signal processed by the pre-processing unit 121 of Fig. 10 might still have phase and frequency modulation, but calculating energy as disclosed by Cheng does not consider phase or frequency modulation (i.e., Cheng calculates energy as a simple function of amplitude squared with no phase or frequency components).

In contrast to this, in each of the disclosed embodiments, Applicant is careful to determine the rapid changes as a function of modulation attributes. At least one example of modulation attributes is presented immediately below.

In terms of an amplitude modulation embodiment, Applicant’s Fig. 6A illustrates using an AGC voltage signal within an AGC control circuit (preamp 605 and AGC controller 610) to calculate a metric indicative of a changing environment, as indicated by the curves in Fig. 6B. Because Cheng’s RxI and RxQ signals are outputs after an AGC control circuit, curves corresponding to the curves of Applicant’s Fig. 6B would be substantially flat and yield no information with regard to a changing environment.

In terms of a frequency modulation embodiment, Applicant discloses in Fig. 7 use of a frequency error signal to calculate a metric indicative of a changing environment. As stated in the specification at page 15, lines 20-21 as originally filed, “[t]he CDMA codes 705 are amplitude compensated by the pre-amplifier 605 (Fig. 6A) in the AGC loop.” Thus, Applicant’s frequency modulation embodiment can use the amplitude demodulated signal to calculate a metric indicative of a changing environment through use of the frequency modulation remaining on the signal. Cheng neither discloses nor suggests any such embodiment.

In terms of a phase modulation embodiment, Applicant discloses use of a signal that is a function of phase modulation to calculate a metric indicative of a changing environment. For example, Applicant discloses (i) in Fig. 7, use of code phase reference signals RxI/Q output by a CDMA receiver, (ii) in Fig. 8, use of a code phase adjustment signal in a delay lock loop, (iii) in

Fig. 9A, use of a code phase correlation output from a matched filter, and (iv) in Fig. 10A, use of correlation outputs after a correlator (i.e., generic delay lock loop). Cheng neither discloses nor suggests any such embodiments.

Thus, Cheng does not disclose every limitation of Applicant's claim 1 ("calculating a metric . . . as a function of a change in at least one modulation attribute of a signal transmitted across the wireless link"). Accordingly, Applicant respectfully submits that the rejection under 35 U.S.C. §102(b) as being anticipated by Cheng is improper and should be withdrawn.

Because claims 2-8, 11, 14, and 18-20 depend from claim 1, these claims should be allowed for at least the same reasons.

Independent claims 21, 41, and 42 includes similar limitations as claim 1 and should be allowed under 35 U.S.C. §102(b) for similar reasons.

Because claims 22-28, 31, 34, and 38-40 depend from claim 21, these claims should be allowed for at least the same reasons.

Claims 9-10, 12-13, 15-17, 29-30, 32-33, and 35-37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng in view of Thomas (U.S. 6,697,642 B1). Because these dependent claims depend from the independent claims, the arguments above apply.

Thomas is being applied for its disclosure of an antenna that can change modes from directional to omni-directional when a signal representing motion that is output by a motion sensor connected to a mobile unit exceeds a given threshold (see column 17, lines 5-15, and lines 41-51). However, a motion sensor does not interact with circuitry used to process modulated communications signals. Therefore, Thomas does not disclose every limitation of Applicant's claim 1 ("calculating a metric . . . as a function of a change in at least one modulation attribute of a signal transmitted across the wireless link"), nor does Thomas disclose shortcomings of Cheng in this regard.

Because neither Cheng nor Thomas, either alone or in combination, teach, suggest, or provide motivation for Applicant's independent claims, the dependent claims 9-10, 12-13, 15-17, 29-30, 32-33, and 35-37 should be allowed for at least the same reasons as the independent claims under 35 U.S.C. §103(a) over Cheng in view of Thomas.

CONCLUSION

In view of the above remarks, it is believed that all claims (1-42) are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By Mark B. Solomon
Mark B. Solomon
Registration No. 44,348
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133

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